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APPRENTICESHIP TRAINING

Auto Body Technician Program

Alberta
LEARNING
Apprenticeship and Industry Training

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Care has been taken to acknowledge all sources and references in these materials. If there are any inadvertent omissions, please contact Alberta Learning, 10th floor, Commerce Place, Edmonton, Alberta, Canada, T5J 4L5.

Auto Body Technician

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Course Outline

Apprenticeship and Industry Training System

Apprenticeship is post-secondary education with a difference. It helps ensure Alberta has a steady supply of highly skilled employees, the foundation of our economy's future health and competitiveness.

Apprentices in more than 50 trades and crafts spend between one and four years learning their trade - 80% of the time on the job under the supervision of a certified journeyman or qualified tradesperson. The balance of the program is technical training in the theory, skills and technologies of their trade.

To become certified journeymen apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board (the Board) and a network of local and provincial industry committees.

The graduate of the Auto Body Prepper apprenticeship training is a journeyman who will be able to:

- through competent application of his/her skills and knowledge, be proficient in all phases of auto body prepping.
- use hand tools and powered equipment in a proper and safe manner.
- relate to the work of other tradesman in the automotive industry.
- perform assigned tasks in accordance with quality and production standards required by the industry.
- apply primers, primer surfacers and corrosion proofing materials.

The graduate of the Auto Body Refinisher apprenticeship training is a journeyman who will be able to:

- through competent application of his/her skills and knowledge, be proficient in all phases of auto body refinishing.
- use hand tools and powered equipment in a proper and safe manner.
- relate to the work of other tradesman in the automotive industry.
- perform assigned tasks in accordance with quality and production standards required by the industry.
- apply primers, primer surfacers and corrosion proofing materials.
- paint motor vehicles.

The graduate of the Auto Body Repairer apprenticeship training is a journeyman who will be able to:

- through competent application of his/her skills and knowledge, be proficient in all phases of auto body repair.
- use hand tools and powered equipment in a proper and safe manner.
- relate to the work of other tradesman in the automotive industry.
- perform assigned tasks in accordance with quality and production standards required by the industry.
- straighten and align frames and unitized structures.
- apply primers, primer surfacers and corrosion proofing materials.
- repair, replace and align chassis components.
- repair and replace drive line support systems.
- repair and replace structural and non-structural motor vehicle sections.

The graduate completing both the Auto Body Refinisher and Repairer apprenticeship training receives journeyman certification as an Auto Body Technician who will be able to:

- through competent application of his/her skills and knowledge, be proficient in all phases of auto body refinishing and repair.
- use hand tools and powered equipment in a proper and safe manner.
- relate to the work of other tradesman in the automotive industry.
- perform assigned tasks in accordance with quality and production standards required by the industry.
- apply primers, primer surfacers and corrosion proofing materials.
- paint motor vehicles.
- straighten and align frames and unitized structures.
- repair, replace and align chassis components.
- repair and replace drive line support systems.
- repair and replace structural and non-structural motor vehicle sections.

Apprenticeship and Industry Training Committee Structure

While government supports Alberta's apprenticeship and industry training system, it is driven by industry, a term which includes both employers and employees. The Alberta Apprenticeship and Industry Training Board, with the support of Alberta Learning, oversees the system. But the system relies on a network of industry committees. These committees include local and provincial apprenticeship committees (LACs and PACs) in the designated trades and occupational committees in the designated occupations, as well as other committees such as provisional committees established before the designation of a new trade or occupation comes into effect. All these committees are composed of equal numbers of employers and employees. The network of industry committees is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the Board can set up a LAC. The Board appoints equal numbers of employees and employers for terms of up to three years. The committee appoints a member as presiding officer. Local Apprenticeship Committees:

- monitor the apprenticeship system, and the progress of apprentices in their trade, at the local level.
- help settle certain kinds of issues between apprentices and their employers.
- recommend improvements in apprenticeship training and certification to their trade's provincial apprenticeship committee.
- make recommendations to the Board regarding the appointment of members to their trade's PAC.

Provincial Apprenticeship Committees (PAC)

The Board establishes a PAC for each trade and, based on PAC recommendations, appoints a presiding officer and equal numbers of employees and employers for terms of up to three years. Most PACs have nine members. Provincial Apprenticeship Committees:

- identify the training needs and content for their trade.
- recommend to the Board the standards for training and certification for their trade.
- monitor the activities of local apprenticeship committees in their trade.
- make recommendations to the Board about the designation of trades and occupations.
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in the trade.
- may participate in resolving any apprenticeship-related disputes between employers and employees.

Auto Body Technician PAC Members

Mr. B. Hemstreet	Red Deer	Presiding Officer
Mr. R. Backs	High Prairie	Employer
Mr. D. Critchlow	Medicine Hat	Employer
Mr. T. Lane	Fort McMurray	Employer
Mr. J. O'Toole	Grande Prairie	Employer
Mr. D. Engelking	Edmonton	Employee
Mr. W. Keen	Calgary	Employee
Mr. M. Peacock	Edmonton	Employee
Mr. G. Shaw	Lethbridge	Employee

The Alberta Apprenticeship and Industry Training Board (Board)

The mandate of the Alberta Apprenticeship and Industry Training Board relates to the standards and requirements for training and certification in programs under the *Apprenticeship and Industry Training Act*. The Board provides advice to the Minister of Learning on the training and certification of people in designated trades and occupations and on the needs of the Alberta labour market for skilled and trained persons. The Board also makes orders and regulations respecting standards and requirements for apprenticeship programs and the training of apprentices and for training and certification in designated trades and occupations, and the criteria or requirements for granting and recognizing trade and other certificates.

The 13-member Board consists of a chairman, eight members representing trades and four members representing other industries. The trades and other industry members are equally represented by employer and employee representatives.

Safety Education

Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees and the public. Therefore, it is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to or cause an accident or injury.

It is generally recognized that a safe attitude contributes to an accident free environment. Everyone will benefit as a result of a healthy, safe attitude towards prevention of accidents.

A tradesperson is possibly exposed to more hazards than any other person in the work force and, therefore, should be familiar with and apply the Occupational Health and Safety Act and Regulations dealing with personal safety and the special safety rules applying to each task.

Legal and Administrative Aspects of Safety

Accident prevention and the provisions of safe working conditions are the responsibilities of an employer and employee.

Employer's Responsibilities

The employer is responsible for:

- providing and maintaining safety equipment, and protective devices and clothing.
- enforcing safe working procedures.
- providing safeguards for machinery, equipment and tools.
- observing all accident prevention regulations.
- training employees in the safe use and operation of equipment.

Employee's Responsibilities

The employee is responsible for:

- working in accordance with the safety regulations pertaining to the job environment.
- working in such a way as not to endanger themselves or fellow employees.

Workplace Health and Safety's Responsibilities:

Workplace Health and Safety (Alberta Human Resources and Employment) will conduct periodic inspections of the workplace to ensure that safety regulations for industry are being observed.

Technical Training Establishment

Alberta Learning, Apprenticeship and Industry Training offer your apprenticeship training program. Staff and facilities for delivering the program are supplied by:

- Northern Alberta Institute of Technology
- Southern Alberta Institute of Technology

Procedures For Recommending Revisions To The Course Outline

Apprenticeship and Industry Training, Industry Programs and Standards has prepared this course outline in partnership with the Auto Body Technician Provincial Apprenticeship Committee.

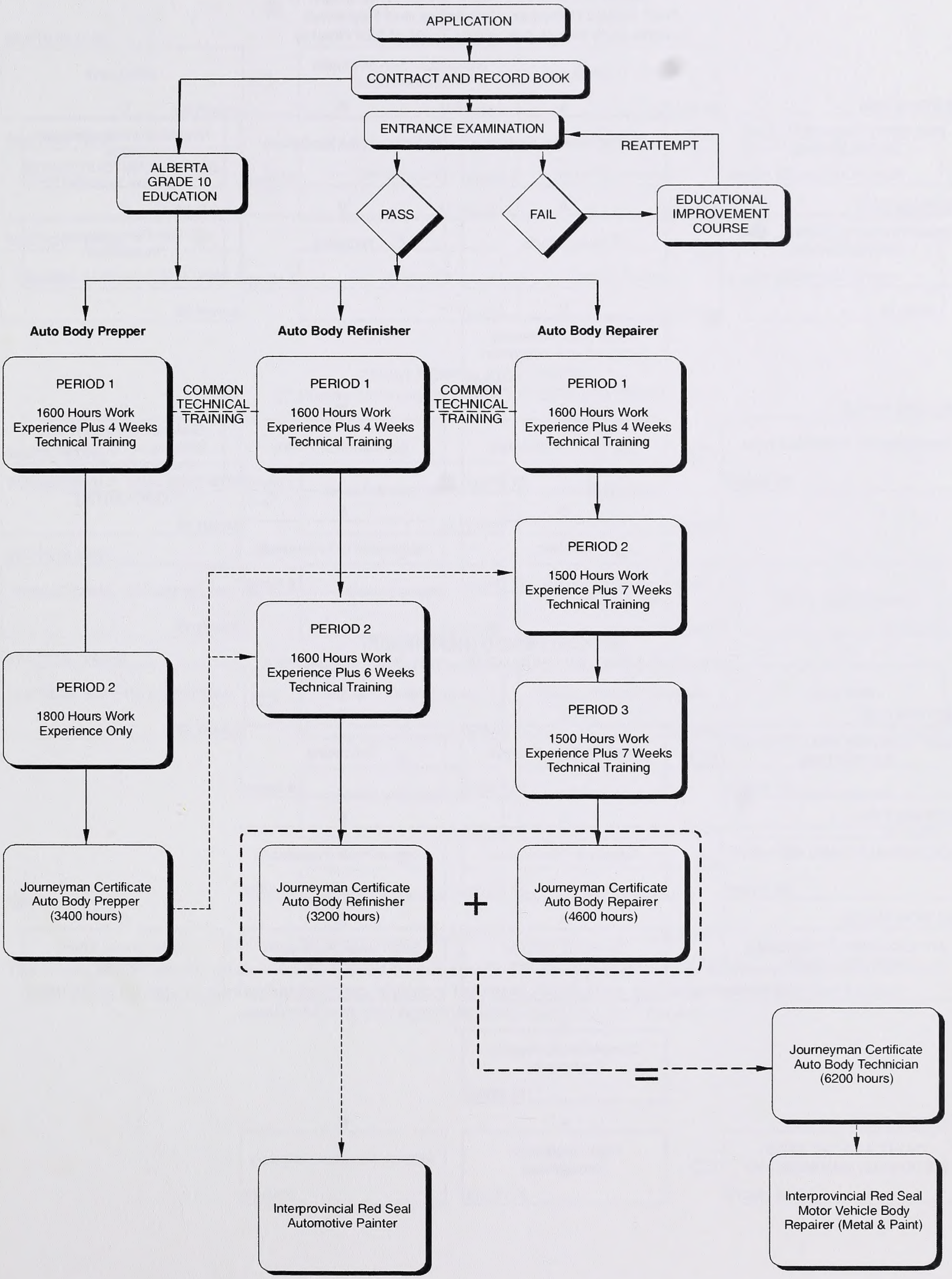
This course outline was approved on April 19, 2002 under the authority of the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. Valuable input is acknowledged from industry and the institutions.

Any concerned citizen or group in the Province of Alberta may make recommendations for change by writing to:

Auto Body Technician Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
10th floor, Commerce Place
10155-102 Street
Edmonton, AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations received will be placed before regular meetings of the Provincial Apprenticeship Committee.

Apprenticeship Route Toward Certification



AUTO BODY TECHNICIAN TRAINING PROFILE

First Period (Prepper, Refinisher and Repairer)
(4 weeks, 30 Hours per week; Total of 120 Hours)

SECTION ONE

INDUSTRY OVERVIEW AND REGULATIONS
16 Hours

A	B	C
Apprenticeship System 4 Hours	Safety in the Workplace 6 Hours	Regulations that affect the Trade 6 Hours

SECTION TWO

COMPONENT REMOVAL AND INSTALLATION
39 Hours

A	B	C
Use of Tools 12 Hours	Batteries 5 Hours	Trim Removal and Installation 8 Hours

D
Component Assembly Removal and Installation 14 Hours

SECTION THREE

SUBSTRATE PREPARATION
65 Hours

A	B	C
Substrate Identification 11 Hours	Application of Fillers 12 Hours	Surface Preparation and Stripping using Abrasives and/or Chemicals 12 Hours

D	E
Masking 12 Hours	Application of Undercoats 18 Hours

SECOND PERIOD (REFINISHER)
(6 WEEKS 30 HOURS PER WEEK – TOTAL OF 180 HOURS)

SECTION ONE

PAINT DAMAGE ANALYSIS AND ESTIMATING
31 Hours

A	B
Paint Damage Analysis 16 Hours	Estimating 15 Hours

SECTION TWO

COLOUR MATCHING OF PAINT
35 Hours

A	B
Adjusting Paint Colour 26 Hours	Topcoat Paint Preparation 9 Hours

SECTION THREE

APPLICATION OF FINISHES AND TOPCOATS
80 Hours

A	B	C
Complete Topcoat Application Techniques 24 Hours	Spot Repair Application Techniques 24 Hours	OEM Special Effect Topcoats 16 Hours

D
Composite Refinishing Techniques 16 Hours

SECTION FOUR

PAINT AND RELATED MATERIALS MANAGEMENT
34 Hours

A	B
Paint Application Management 25 Hours	Refinish Materials Inventory 9 Hours

SECOND PERIOD (REPAIRER)
(7 Weeks 30 Hours Per Week – Total of 210 Hours)

SECTION ONE

WELDING
69 Hours

- **A** — Metal Heating, Cutting and Bead Running — 24 Hours
- **B** — Gas Metal Arc Welding — 45 Hours

SECTION TWO

NON-STRUCTURAL PANEL REPAIR WORK
98 Hours

- **A** — Metal Repair — 35 Hours
- **B** — Metal Replacement — 35 Hours
- **C** — Composite Repairs — 28 Hours

SECTION THREE

VEHICLE SUPPORT SYSTEMS
43 Hours

- **A** — Air Conditioning — 12 Hours
- **B** — Cooling System — 6 Hours
- **C** — Electrical System — 25 Hours

THIRD PERIOD (REPAIRER)
(7 Weeks 30 Hours Per Week – Total of 210 Hours)

SECTION ONE

BODY DAMAGE ANALYSIS AND ESTIMATING
32 Hours

- **A** — Body Damage Analysis — 12 Hours
- **B** — Estimating — 20 Hours

SECTION TWO

STRUCTURAL REPAIR WORK
97 Hours

- **A** — Body Correction — 46 Hours
- **B** — Component Replacement and Sectioning — 39 Hours
- **C** — Glass Replacement — 12 Hours

SECTION THREE

VEHICLE SUPPORT SYSTEMS
81 Hours

- **A** — Active Restraint System — 3 Hours
- **B** — Passive Restraint System — 6 Hours
- **C** — Drive Train — 6 Hours
- **D** — Fuel Supply System — 6 Hours
- **E** — Exhaust System — 3 Hours
- **F** — Brake System — 12 Hours
- **G** — Wheels, Hubs and Tires — 9 Hours
- **H** — Wheel Alignment — 36 Hours

The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING

AUTO BODY TECHNICIAN TRADE
COURSE OUTLINE
(PREPPER, REFINISHER, REPAIRER)

SECTION ONE: ..... INDUSTRY OVERVIEW AND REGULATIONS ..... 16 HOURS

A. Apprenticeship System .....4 Hours

Outcome: ***Explain the role and purpose of the advisory network and Provincial Apprenticeship Committee structure for the Auto Body Technician trade.***

1. Describe the structure and purpose of provincial and local apprenticeship committees.
2. State the process involving the Contract of Apprenticeship and Record Book.
3. Outline the Training Profile for the Auto Body Technician Trade.
4. Be aware of the need for compliance with Apprenticeship Act and Regulations.

B. Safety in the Workplace .....6 Hours

Outcome: ***Recognize safety hazards present in the worksite and take actions to protect yourself and others from them.***

1. Describe the types of personal hazards associated with the work assigned to a prepper (electrical tools, rotating machinery, comp. air, jacking and hoisting, exhaust gases, etc.).
2. Identify and use safety equipment and procedures when dealing with hazards associated with being a prepper.
3. Practice safe care and control of hazardous products commonly used by preppers.
4. Recognize and describe environmental hazards associated with the trade (spills, refrigerants, used oil, antifreeze, paint booth filters and exhaust, etc.).
5. Use and maintain supplied air breathing systems.

C. Regulations that affect the Trade .....6 Hours

Outcome: ***Describe employer and employee responsibilities related to the regulations applying to the Auto Body trade.***

1. Recognize, explain and comply with Workplace Health and Safety regulations.
2. Recognize, explain and comply with WHMIS regulations.
3. Recognize, explain and comply with Fire Regulations.
4. Recognize, explain and comply with WCB regulations.
5. Recognize, explain and comply with environmental regulations (VOC).

SECTION TWO: .....COMPONENT REMOVAL AND INSTALLATION..... 39 HOURS

A. Use of Tools .....12 Hours

Outcome: Identify and use the basic hand and power tools common to the trade.

1. Identify hand tools and explain their use in the trade.
2. Identify power tools and explain their use in the trade.
3. Use hand and power tools common to a prepper.

B. Batteries .....5 Hours

Outcome: Service, test and diagnose problems related to batteries.

1. Explain the purpose, construction, operation and ratings of batteries.
2. Test and service batteries.
3. Diagnose problems attributed to batteries.
4. Perform battery charging and boosting operations.

C. Trim Removal and Installation .....8 Hours

Outcome: Remove and install interior and exterior trim to minimize damage and improve refinish quality.

1. Identify and state the purpose of trim.
2. Assess trim for damage and determine a repair procedure.
3. Remove and install interior trim components such as, door panels, instrument panels and garnish mouldings.
4. Remove and install exterior trim components such as, belt, body side and reveal mouldings as well as mirrors and door handles.

D. Component Assembly – Removal and Installation .....14 Hours

Outcome: Remove and install components following industry-approved methods.

1. Describe the operation of passive restraint systems.
2. Describe the procedures for dealing with an unemployed passive restraint system.
3. Identify the types and location of glass in automotive use (structural and non-structural).
4. Remove and replace moveable non-structural glass.
5. Explain how to perform leak tests on a vehicle (wind, water and dust).
6. Assess operation of interior components (doors, windows, seats etc.).
7. Remove and replace a bumper assembly.
8. Describe body panel alignment of bolt-on components.
9. Describe removal and installation of road wheel.
10. Perform headlight alignment.

SECTION THREE:..... SUBSTRATE PREPARATION ..... 65 HOURS

A. Substrate Identification .....11 Hours

Outcome: Identify types of paint finishes.

1. Clean the substrate surface and vehicle.
2. Identify substrate.
3. Identify existing substrate conditions.
4. Determine and follow a preparation procedure.

B. Application of Fillers .....12 Hours

Outcome: Use fillers to repair minor imperfections that do not require repair work--no more than 1/8" (3 mm) deep.

1. Identify the different types of fillers and their proper use on metals and composites.
2. Use the correct filler to repair minor imperfections on sheet metal (no more than 1/8" (3 mm) deep).

C. Surface Preparation and Stripping using Abrasives and/or Chemicals .....12 Hours

Outcome: Reduce mil thickness, smooth and level a substrate using industry available abrasive and chemical systems.

1. Describe different methods of paint removal (include good substrate and poor substrate)(chemical stripping, media blasting and sandpapers).
2. Perform a sanding process to properly prepare a metal substrate for undercoat application.
3. Describe a sanding process to properly prepare a composite substrate for undercoat application.
4. Perform a sanding process to properly prepare a metal substrate for topcoat application.
5. Describe a sanding process to properly prepare a composite substrate for topcoat application.

D. Masking .....12 Hours

Outcome: Use masking technology available to the industry for undercoat and topcoat application.

1. Describe different methods and materials used for masking of a vehicle to prepare it for undercoat or topcoat application.
2. Mask a repair area or vehicle for undercoat application.
3. Mask a repair area or vehicle for topcoat application.

E. Application of Undercoats .....18 Hours

Outcome: Prepare and apply undercoats and corrosion protection compounds used in the industry.

1. Operate and maintain refinishing equipment (spray guns).

2. Select and mix undercoats to manufacturers specifications.
3. Apply various undercoats to properly prepared substrates.
4. Describe the application of various corrosion protection compounds.
5. Describe the process of edge painting body components.
6. Identify the types of topcoat finishes used in the automotive industry today.
7. Find and identify a vehicle paint code.

SECOND PERIOD TECHNICAL TRAINING (REFINISHER)

AUTO BODY TECHNICIAN TRADE
COURSE OUTLINE

SECTION ONE: ..... PAINT DAMAGE ANALYSIS AND ESTIMATING ..... 31 HOURS

A. Paint Damage Analysis .....16 Hours

Outcome: ***Evaluate and describe paint application faults on a vehicle and determine the correct method of repair.***

1. Identify the major paint application faults and causes (dry spray, sags, runs, orange peel, solvent popping,
2. fish eyes, metallic mottling, pinholes, etc.).
3. Develop a repair procedure to remedy the faults (wet and cured paint finishes).

B. Estimating .....15 Hours

Outcome: ***Produce an accurate refinish estimate and repair order.***

1. Define the requirements of an estimate.
2. Describe how to use industry recognized manual and automated reference guides to prepare a complete and accurate estimate.
3. Describe how to prepare a complete and accurate estimate (handwritten and/or computer-generated).
4. Describe the procedure for presenting an estimate to a customer.
5. Read and comprehend repair orders.
6. Create a repair order from an estimate.

SECTION TWO: .....COLOUR MATCHING OF PAINT ..... 35 HOURS

A. Adjusting Paint Colour.....26 Hours

Outcome: ***Adjust a paint colour to a vehicle in order to achieve a blendable match.***

1. Describe paint composition.
2. Explain colour theory.
3. Recognize a colour mismatch.
4. Adjust colour using gun technique to produce a blendable match.
5. Tint a paint using a recommended procedure to produce a blendable match.
6. Verify colour match using industry-approved methods (e.g. spray out cards, etc.).

B. Topcoat Paint Preparation ..... 9 Hours

Outcome: ***Identify the type of finish and determine the appropriate amount of finish material for a given procedure.***

1. Select a formula that corresponds to a paint code.
2. Determine the amount of paint required for a job.
3. Follow manufacturers instructions and mix the appropriate type of paint for a job.
4. Correct an over-pour situation when mixing paint.

SECTION THREE:..... APPLICATION OF FINISHES AND TOPCOATS ..... 80 HOURS

A. Complete Topcoat Application Technique ..... 24 Hours

Outcome: ***Perform completes using different types of topcoats and finishes.***

1. Prepare a spray booth for vehicle refinishing.
2. Identify the circumstances when different sealers are required.
3. Describe a complete topcoat application using a single stage product.
4. Describe a complete topcoat application using a two-stage product.
5. Perform a topcoat application.

B. Spot Repair Application Techniques ..... 24 Hours

Outcome: ***Perform spot repairs using different types of topcoats and finishes.***

1. Perform a spot repair using a single-stage product.
2. Perform a spot repair using a two-stage product.

C. OEM Special Effect Topcoats ..... 16 Hours

Outcome: ***Perform processes for completes and spot repairs when dealing with OEM special effects.***

1. Identify and describe the types of multi-stage finishes applied by the vehicle manufacturers.
2. Describe tri-coat spot and complete refinish procedures.
3. Perform a tri-coat spot repair.
4. Describe multi-chromatic (chameleon paint) spot and complete refinish procedures.

D. Composite Refinishing Techniques ..... 16 Hours

Outcome: ***Refinish vehicle composites.***

1. Describe the use of adhesion promoters when refinishing composites.
2. Describe the use of flex agents when refinishing composites.

3. Identify the topcoats used for the refinishing of composites.
4. Describe the refinishing of composites.

SECTION FOUR: ..... PAINT AND RELATED MATERIALS MANAGEMENT.....34 HOURS

A. Paint Application Management.....25 Hours

Outcome: ***Create and manage an environment that ensures the refinishing process produces quality finishes.***

1. Describe the operation and maintenance of a compressed air supply system.
2. Describe the operation of a spray booth and prep station.
3. Perform basic maintenance cleaning of a spray booth or prep station.
4. Identify the requirements of a paint mixing room.
5. Describe the steps required to prepare the refinisher, the vehicle and the spray equipment for applying finishes.

B. Refinish Materials Inventory.....9 Hours

Outcome: ***Maintain an accurate count of required materials and order replacement stock to minimize disruption of workflow.***

1. Identify methods of the physical inventory control.
2. Describe inventory ordering and the relation to turnover.
3. Describe the relationship between record keeping procedures and efficient operation of a paint department (custom paint formula records, spray out cards, etc.).

SECOND PERIOD TECHNICAL TRAINING (REPAIRER)

AUTO BODY TECHNICIAN TRADE
COURSE OUTLINE

SECTION ONE: ..... WELDING ..... 69 HOURS

A. Metal Heating, Cutting and Bead Running .....24 Hours

Outcome: ***Demonstrate safe welding and/or cutting procedures on steel when using oxyacetylene and plasma equipment.***

1. Assemble, adjust and operate oxyacetylene welding equipment.
2. Assemble, adjust and operate oxyacetylene cutting equipment.
3. Assemble, adjust and operate plasma-cutting equipment.
4. Troubleshoot and maintain oxyacetylene and plasma equipment.

B. Gas Metal Arc Welding.....45 Hours

Outcome: ***Produce industry acceptable welds on steel and aluminum.***

1. Assemble, adjust and operate GMAW welding equipment.
2. Perform industry-acceptable lap, butt and plug welds on 16 & 20 gauge steel.
3. Demonstrate the ability to weld in the flat, vertical and horizontal positions.
4. Describe the process for aluminium welding.
5. Recognize, identify and correct weld faults
6. Troubleshoot and maintain GMAW equipment.

SECTION TWO: .....NON-STRUCTURAL PANEL REPAIR WORK..... 98 HOURS

A. Metal Repair .....35 Hours

Outcome: ***Perform metal repair work using body repair tools.***

1. Perform a rough-out on a damaged panel.
2. Complete a dinging operation on a roughed-out panel.
3. Perform a metal shrinking operation using oxyacetylene equipment.
4. Metal finish a panel after dinging operation is complete.
5. Apply and sand body filler on a panel after metal finishing operation.

B. Metal Replacement .....35 Hours

Outcome: ***Remove and replace collision or corrosion damaged panels or sections of sheet metal components.***

1. Remove a piece of collision or corrosion damaged panel.
2. Create a replacement piece for a collision or corrosion damaged panel.
3. Adhesively bond a replacement piece into a collision or corrosion damaged panel.
4. Weld a replacement piece into a collision or corrosion damaged panel.
5. Describe the removal and replacement of a damaged outer door panel assembly using welding equipment.
6. Describe the removal and replacement of an outer door panel using adhesive-bonding techniques.

C Composite Repairs .....28 Hours

Outcome: ***Perform repairs to composite components of a vehicle.***

1. Identify substrate as to type of composite (using location, symbols and tests).
2. Develop a plan for repairing damaged flexible, semi-rigid and rigid components.
3. Describe welded repairs on panels.
4. Perform adhesive-bonded repairs on panels.

SECTION THREE:.....VEHICLE SUPPORT SYSTEMS..... 43 HOURS

A. Air Conditioning System .....12 Hours

Outcome: ***Remove and replace the components of an A/C system.***

1. Identify the major components of an A/C system.
2. Describe the operation of an A/C system.
3. Describe the recovery of refrigerant prior to disassembly of a system.
4. Describe the removal and replacement of major components of an A/C system.

B. Cooling System.....6 Hours

Outcome: ***Remove and replace cooling system components.***

1. Identify the major components of a cooling system.
2. Describe the operation of a cooling system.
3. Describe the safe handling and disposal of coolant.
4. Describe the removal and replacement of cooling system components.

C. Electrical System .....25 Hours

Outcome: Remove and replace vehicle body electrical system components.

1. Explain basic electrical theory.
2. Recognize electrical terms and symbols.
3. Identify basic electrical circuits and their faults.
4. Correctly use a voltmeter, ammeter, ohmmeter and test light to identify a shorted, open or grounded electrical circuit.
5. Identify those electrical/electronic systems most commonly affected by collision damage. (lighting circuit, power accessories, interior lighting, rear window defrost).
6. Describe generic troubleshooting steps for collision-damaged electrical systems.
7. Describe the hazards associated with electrostatic discharge (ESD) when working with vehicle electronic systems.
8. Describe removal and replacement procedures of damaged or defective electrical/electronic components.
9. Perform industry-approved simple wire harness and connector repairs (soldering single wires, replacing fusible links, replacing terminal connectors, etc.).

THIRD PERIOD TECHNICAL TRAINING (REPAIRER)

AUTO BODY TECHNICIAN TRADE
COURSE OUTLINE

SECTION ONE: .....BODY DAMAGE ANALYSIS AND ESTIMATING..... 32 HOURS

A. Body Damage Analysis .....12 Hours

Outcome: Create a repair plan based on an analysis of body damage.

1. Identify types of collision damage (side sway, sag, mash, diamond, twist, etc.).
2. Explain the principles of measurement based on vehicle construction (3 Box principle, etc.).
3. Use and maintain gauging equipment to assist in damage analysis.
4. Analyze collision damage for: severity, direction, location and extent.
5. Create a repair plan.

B. Estimating .....20 Hours

Outcome: Produce an accurate collision damage estimate and repair order.

1. State the requirements of an estimate.
2. Prepare a complete and accurate estimate using industry recognized manual and/or automated reference guides (Handwritten and/or computer-generated).
3. Describe the procedure for presenting an estimate to a customer.
4. State the purpose of business/insurance forms used in the industry.
5. Read and comprehend repair orders.
6. Create a repair order from an estimate.

SECTION TWO: .....STRUCTURAL REPAIR WORK ..... 97 HOURS

A. Body Correction.....46 Hours

Outcome: Straighten and align unibody/frame structures.

1. Follow a repair plan to correct collision damage.
2. Anchor a vehicle to straightening equipment.
3. Perform straightening and aligning procedures to restore a vehicle to pre-accident condition.
4. Perform maintenance of straightening equipment.

B. Component Replacement and Sectioning ..... 39 Hours

Outcome: Replace structural components using industry approved methods.

1. Describe the process of replacing and/or sectioning a B-pillar.
2. Describe the process of replacing and/or sectioning a rocker panel.
3. Describe the process of replacing a roof panel (new and used).
4. Describe the process of replacing and/or sectioning a front or rear unibody frame member.
5. Describe the process of sectioning a body over frame (BOF) frame rail (OEM procedure).
6. Describe the process of replacing and/or sectioning a quarter panel.
7. Perform a sectioning operation on a structural component.

C. Glass Replacement ..... 12 Hours

Outcome: Be aware of and use industry-approved methods for structural glass replacement and perform body-squaring operations.

1. Identify location of structural glass components in a motor vehicle.
2. Describe the different methods of structural glass replacement.
3. Perform a body-squaring operation using a structural glass component.

SECTION THREE: ..... VEHICLE SUPPORT SYSTEMS ..... 81 HOURS

A. Active Restraint Systems ..... 3 Hours

Outcome: Inspect and replace active restraint systems.

1. Explain the purpose of active restraint systems.
2. Identify components of an active restraint system.

B. Passive Restraint Systems ..... 6 Hours

Outcome: Service deployed passive restraint systems.

1. Explain the purpose of passive restraint systems.
2. Identify components of a passive restraint system.
3. Recognize passive restraint system faults using on-board diagnostics.
4. Describe component replacement procedures.

C. Drive Train ..... 6 Hours

Outcome: Remove and install drive train components.

1. Identify the major components of a drive train.

2. Describe the process to remove and replace damaged components of a drive train
3. Describe the process to remove and replace a complete drive train to accommodate structural repairs.

D. Fuel Supply System ..... 6 Hours

Outcome: Remove and install fuel supply system components.

1. Identify the different fuels used to power motor vehicles and the precautions for working around them.
2. Identify the major fuel supply system components (Tanks, lines, filters, pumps, carbon canisters and inertia switches).
3. Describe the operation of a fuel supply system.
4. Describe the recovery of fuel during a disassembly process.
5. Describe the removal and replacement of the major components of a fuel supply system (Tanks, lines, filters and pumps).

E. Exhaust System ..... 3 Hours

Outcome: Remove and install exhaust system components.

1. Identify the major components of an exhaust system.
2. Describe the process to remove and replace components of an exhaust system.

F. Brake System ..... 12 Hours

Outcome: Remove and replace components of a brake system.

1. Identify major brake system components.
2. Recognize an ABS equipped vehicle, the major components of the system and the precautions required to work safely around such a system.
3. Describe the inspection process to identify damaged and worn components of a brake system.
4. Describe the removal and replacement of major brake system components.
5. Perform a basic brake system operation check.

G. Wheels, Hubs and Tires ..... 9 Hours

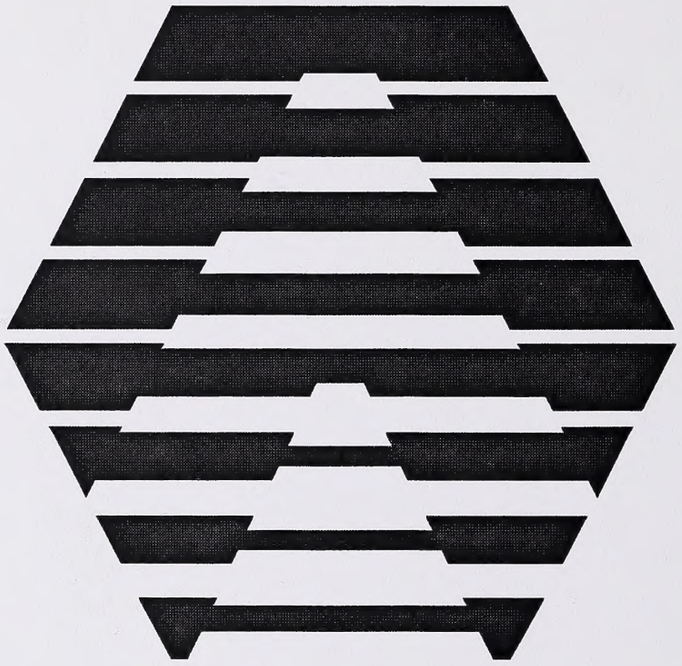
Outcome: Diagnose and service wheels, tires and wheel bearings.

1. Explain the construction, sizing, rating and design features of tires and wheels.
2. Demonstrate the correct procedures for balancing and installing wheels and tires.
3. Describe inspection, cleaning and repacking of wheel bearings.
4. Demonstrate the correct procedures to install and adjust wheel bearings.
5. Diagnose problems related to and service wheels, tires and wheel bearings.

H. Wheel Alignment.....36 Hours

Outcome: ***Perform wheel alignments to verify structural integrity and identify damaged steering and suspension components.***

1. Identify the major components of the steering and suspension systems and describe their functions.
2. Describe wheel alignment angles and their relationships.
3. Describe the removal and replacement of components of the steering and suspension systems.
4. Take wheel alignment readings to verify proper structural repairs and identify damaged components.
5. Maintain basic wheel alignment equipment.



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